

REMARKS

This is in response to the Office Action dated September 30, 2003. In the Office Action, the Examiner cited a new reference, Ahmad et al. (US Patent No: 5,818,984), as a primary reference in view of previously cited references to reject Claims 1-6, 8-13, 15 and 16 under 35 U.S.C. 103(a). Claims 1, 8 and 15 have been amended as above. The rejection is respectfully traversed because the Ahmad et al. and all the secondary references, individually or in combination, fail to teach every element as claimed.

SUMMARY

The Office Action rejected independent Claims 1, 8 and 15 under 35 U.S.C. 103(a) as being unpatentable over Ahmad et al. (US Patent No: 5,818,984) in view of Davidson (US Patent No: 6, 160,653).

In Claim 1 of Applicant's invention, a plurality of optical pathways is formed solely through air between the circuit cards, and the optical pathways form a plurality of optical connections between the LED on at least one of circuit cards and the photodiodes on the other circuit cards. Ahmad et al., by specifically teaching that optical connection is establish only between dedicated pair of transmitter and receiver on adjacent chips, fails to teach a plurality of optical connections between the LED on at least one of circuit cards and the photodiodes on the other circuit cards.

In Claim 8 of Applicant's invention, the backplane having a plurality of circuit card connectors ... for supporting circuit cards extending normal to the backplane in a generally upright and parallel relationship. As a result, the light generated from at least one of the LED is received by the photodiode formed on **any of the circuit cards**. In other words, the light can not only be transmitted between adjacent circuit cards, but can also be transmitted between circuit cards which are not adjacent to each other. Ahmad et al., by specifically teaching the edge-to-edge arrangement of the chips and the optical signal transmission limited between adjacent circuit cards, teaches away Claim 8.

With regard to Claim 15 of Applicant's invention, Ahmad et al. fails to teach the circuit cards extending normal to the backplane and the **infrared signal** as claimed.

Davidson et al. teaches electrical signal transmission between circuit cards being converted into optical signal. However, Davidson et al. fails to teach optical connections between circuit cards.

Therefore, the rejection over Claims 1, 8 and 15, and the dependent claims thereof, is respectfully traversed because both Ahmad et al. and Davidson, individually or in combination, fail to teach every element as claimed.

The Amendment

In Claim 1(c), the teaching of “optical connections between the LED on at least one of the circuit cards and the photodiodes of the other circuit cards” is fully supported by the disclosure that states “*an optical pathway can be established between the respective LED and photodiodes 22, 24 of each respective module*” in page 9, lines 27-31 and Figure 2.

In Claims 8 and 15, the teaching of “circuit cards extending normal to the backplane” has been added. In other words, the circuit cards are mounted to the backplane in an upright relationship. Such teaching is not only supported in Figures 1 and 2, but is also supported by Claims 1, 8 and 15 as previously claimed in Claims 1, 8 and 15.

As the amendments have been fully supported by the specification, no new subject matter has been added.

The Ahmad reference

Ahmad et al. teaches that “*multi-chip 10 comprises interconnection substrate 12 and an array of chips 14a-i arranged edge-to-edge*” (Figs. 1-3 and col. 3, lines 53-56). Following the disclosure of edge-to-edge arrangement of the chips 14a-i, Ahmad et al. further teaches “*Each optical transmitter of one chip transmits optical signals across the gap or space between adjacent chips*” (Figs. 1-3, col. 3, lines 46-48).

The teaching of “edge-to-edge” arrangement of the chips disclosed by Ahmad et al. teaches away “the connectors for supporting circuit cards extending normal to the backplane in generally upright and parallel relationship as claimed in Claims 8 and 15” in Applicant’s invention.

As understood, the teaching of "connectors for supporting circuit cards extending normal to the backplane in generally upright and parallel relationship" is not simply a design choice. It allows the optical connections to be established between one LED and multiple photodiodes as claimed in Claim 1(c), and the optical connection established between the LED on one of the circuit cards and the photodiode on any of the other circuit cards as claimed in Claim 8 of Applicant's invention. For example, as shown in Figure 2 of Applicant's invention, the optical signal generated by the LED 22 formed on the module 3 can be transmitted to photodiodes 24 formed on both of the modules 1 and 2; or alternatively, to the photodiode 24 formed on either one of the module 1 or the module 2.

Therefore, by teaching away the "connectors for supporting the circuit cards extending normal to the backplane" as claimed in Claims 8 and 15, Ahmad et al. consequently fails to teach "the optical connections formed between the LED on at least one of the circuit cards and the photodiodes of the other circuit cards" as claimed in Claim 1(c) of Applicant's invention, and "the optical connection between the LED on one of the circuit cards and the photodiode on any one of the other circuits" as claimed in Claim 8 of Applicant's invention.

Ahmad et al. also fails to disclose such module being a **shock-resistant system** as claimed in Claims 1 and 15, and the infrared signal transmitted by the first and second LED's as claimed in Claim 15. It is known in the art that even though the circuit cards mounted to the backplane are located within an enclosure, ambient stray light from various visible or ultra-violet light sources including sun, lamps and other devices cannot be completely blocked from entering the enclosure. If the wavelength of the optical signals/connections is within the range of visible light or even ultra-violet light, the optical connection is easily interfered by ambient light. Therefore, in Claim 15 of Applicant's invention, infrared radiation is selected as the optical connections transmitted between the LED and the photodiode to suppress or eliminate interference by ambient light. (Not in cl. 15)

The Examiner stated that "*Ahmad discloses optically transmitted infrared radiation* (col. 3, lines 25-27)". However, what is disclosed in col. 3, lines 25-27 of Ahmad et al. is a brief description of Fig. 3A and 3B. Ahmad et al. does not disclose infrared radiation/signal.

The Davidson Reference

Davidson teaches an input optical connector card 100 electrically linked with the connector 96 by a set of signal lines 98. The input optical connector card 100 includes a set of signal drivers 102. The signal drivers 102 process electrical signals from the connector 96 and convert them into appropriate driver signals for an array of light producing devices 104 (Col. 9, lines 14-19).

Davidson fails to teach the upright relationship of the circuit cards supported by the circuit card connectors. Davidson also fails to teach the optical pathway formed solely through air forming a respective independent parallel optical connection between said transmitter LED on one of said circuit cards and said receiver photodiode on any one of said circuit cards.

As Ahmad et al. and Davidson, individually or in combination, fails to teach every element as claimed, a *prima facie* case of obviousness is not established. The rejection over Claims 1, 8 and 15, and the dependent Claims 2-6, 9-13 and 16 thereof is respectfully traversed.

The Dependent Claims

Regarding Claims 2 and 9, the Examiner indicated "*Ahmad discloses optically transmitted infrared radiation (col. 3, lines 25-27)*". However, what has been disclosed By Ahmad et al. in col. 3, lines 25-27 is "*Fig. 1. Fig. 3A is a top plane view along lines 3A-3A of Fig. 2. Fig. 3B is a perspective view of an optical beam generator*". The Applicant cannot find the teaching of infrared radiation throughout the whole specification of Ahmad et al.

The Office Action further rejected Claims 3-4 and 10-11 by combining Croft et al. (US Patent No: 5,864,708) with Ahmad et al. and Davidson.

Neither Ahmad et al. nor Davidson teaches the infrared radiation between circuit cards as claimed in Claims 2, 9 and 15. Croft discloses a wireless transceiver 63 within portable computer communicates with a wireless transceiver 64 within a docking station 62. Apparently, the infrared communications is established between the computer and a device external to the computer. Croft fails to teach the wireless communication established

between the circuit cards **within** the computer. There is no teaching or suggestion in the cited references for one skilled in art to modify Croft by converting the external infrared communication into the internal infrared communication within the computer. Consequently, there shows no motivation for one skilled in the art to first modify the teaching in Croft, and then combine the modification of Croft with Davidson and Ahmad et al. into the invention as claimed in Claims 3-4 and 10-11. It appears that the combination proposed by the Examiner is constructed by hindsight of the Applicant's claimed invention. It is error to reconstruct a patentee's claimed invention from the prior art by using the patentee's claim as a blueprint. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (CAFC 1983). Although an Examiner may suggest that the structure of a primary prior art reference could be modified in view of a secondary prior art reference to form the claimed structure, the mere fact that the prior art could be so modified would not make the modification obvious unless the prior art suggested the desirability of the modification. *In re Laskowski*, 871 F.2d 115, 10 USPQ2d 1297 (CAFC 1989). There must be some supporting teaching in the prior art for the proposed combination of references to be proper. *In re Newell*, 891 F.2d 899, 13 USPQ2d 1248 (CAFC 1989).

Claims 5 and 12 are dependent claims of the Claims 1 and 8. As Claims 1 and 8 are patentably distinguishable over the cited reference, Claims 5 and 12 are believed patentable.

The Office Action further rejected Claim 16 as being unpatentable over Ahmad et al. in view of Davidson and in further view of Cargin, Jr. et al. (US Patent No: 6,023,147). Ahmad et al. discloses interconnection between chips mounted to a microelectronic module. Davidson discloses a computer with cards electrically connected by wires, while Cargin, Jr. et al. discloses a hand held computerized data collection terminal. Similarly, as there is no teaching showing desirability for combination in any of the above references, such the combination proposed by the Examiner does not render Claim 16 obvious. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (CAFC 1983). *In re Laskowski*, 871 F.2d 115, 10 USPQ2d 1297 (CAFC 1989). *In re Newell*, 891 F.2d 899, 13 USPQ2d 1248 (CAFC 1989).

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